

Claims

1. Method for gathering flat printed products, especially signatures (2), by selecting a single printed product from each of a multitude of collections of identical printed products and conveying the selected printed products towards a collecting conveyor (10), where the selected printed products are piled up, which runs along a generally straight line in a first direction (11), whereby the method comprises the following steps:

- advancing the printed products in a second direction (15) in a continuous flow of printed products with a feeder (1) with feeding elements upstream of the collecting conveyor (10),
- gripping a leading portion (20) of a printed product at the discharge end of said feeder (1) by separating grippers (60) of a transferring conveyor (40) which is also arranged upstream of the collecting conveyor (10),
- transferring the gripped printed product with the transferring conveyor (40) substantially along a path, which takes its course generally along the first direction (11) of the collecting conveyor (10).

2. Method according to claim 1, characterized in, that a feeder (1) comprises a hopper (50) as a feeding element.

3. Method according to claim 1 or 2, characterized in, that the transfer path of the transferring conveyor (40) is crosswisely arranged towards said second direction (15) and in a principal plane of the printed product to be gripped at the discharge end of said feeder (1).

4. Method according to any of the preceding claims, characterized in, that the printed products delivered by the feeder (1) are advanced forward in a shingled formation.

5. Method according to claim 4, characterized in, that the shingled printed products are arranged on the feeder (1) backwardly superimposed.
6. Method according to any of the preceding claims 1 to 5, characterized in, that the printed products in the feeder (1) and/or the piles (4) in the collecting conveyor (10) are supplied in a substantially horizontal or substantially vertical plane.
7. Method according to any of the preceding claims 2 to 6, characterized in, that the printed products delivered by the feeder (1) are piled in a hopper (50) and the printed product to be taken by the transferring conveyor (40) is one of the lowermost piled samples of the printed products.
8. Method according to any of the preceding claims, characterized in, that the printed products are signatures (2) and the leading portion (20) of the signature (2) to be gripped by the transferring conveyor (40) is the backbone of the signature (2).
9. Method according to any of the preceding claims, characterized in, that a sucking force is applied by at least one vacuum element (33) upon at least the leading portion (20) of a foremost, uppermost or lowermost printed product so that such portion (20) is bent away thereby from the neighbouring upstream printed product.
10. Method according to claim 9, characterized in, that the sucking force acts upon an edge (21) of the leading portion (20) of the printed product upstream of the transferring conveyor (40), and that the leading portion (20) of the printed product is bent away by a separating device, which is moved along a straight line in the first direction from the edge (21) towards the opposite edge of the printed product, and which supports neighbouring upstream printed products during this movement, so that the gripping of the leading portion (20) of the printed product is eased.
11. Apparatus for gathering flat printed products, especially signatures (2), comprising a plurality of feeders (1) arranged in a sequence each for a collection of identical printed products with a selecting device for selecting single flat printed products and a collecting conveyor (10), where the selected printed products are piled up, which runs

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along a generally straight line in a first direction (11), characterized in, that the feeders (1) advance the printed products by feeding elements in a second direction (15) in a continuous flow of printed products, a transferring conveyor (40) comprises at least one separating gripper (60), which is capable of gripping a leading portion (20) of a printed product at the discharge end of a feeder (1), and the transferring conveyor (40) transfers the printed flat products substantially along a path, which takes its course generally along the first direction (11) of the collecting conveyor (10).

12. Apparatus according to claim 11, characterized in, that the feeding elements comprise a hopper (50) where the second direction (15) is the movement of the printed products in a pile through the hopper (50).

13. Apparatus according to claim 11, characterized in, that the feeders (1) are designed to advance the printed products in a shingled formation.

14. Apparatus according to any of the preceding claims 11 to 13, characterized in, that the printed products in the feeder (1) and/or the piles (4) in the collecting conveyor (10) are supplied in a substantially flat lying way.

15. Apparatus according to any of the preceding claims 11 to 14, characterized in, that the transfer path of the transferring conveyor (40) is crosswisely arranged towards said second direction (15) and in a principal plane of the foremost printed product at the discharge end of its feeder (1).

16. Apparatus according to any of the preceding claims 11 to 15, characterized in, that the separating gripper (60) comprises a separating wedge portion (63) with a separating edge (64), which is facing towards the travelling direction of movement of the separating gripper (60).

17. Apparatus according to any of the preceding claims 11 to 16, characterized in, that there is at least one vacuum element (33) for applying a sucking force to at least the leading portion (20) of a foremost, uppermost or lowermost printed product and

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which is arranged in a position that it bends away such portion (20) of the printed product thereby from the neighbouring upstream printed product.

18. Apparatus according to claim 17, characterized in, that the vacuum element (33) is arranged at a position that it acts upon an edge (21) of the leading portion (20) of the printed product upstream of the transferring conveyor (40).

19. Apparatus according to any of the preceding claims 11 to 18, characterized in, that the printed products are fed into an inclined hopper (50), so that the printed products are resting aligned with their backbones along a back-gauge (90).

20. Apparatus according to any of the preceding claims 11 to 19, characterized in, that a plurality of separating grippers (60) are assembled in regular distances to a driving element, which is movable along the discharge ends of the feeders (1) at the same speed and in the same direction as the collecting conveyor (10), and that the separating grippers (60) travel on a guiding rail (13).

21. Apparatus according to claim 20, characterized in, that the distance between the separating grippers (60) is smaller than the distance between the discharge ends of the feeders (1).

22. Apparatus according to any of the preceding claims 11 to 21, characterized in, that the separating gripper (60) comprises a fixed top jaw member (62) with a separating wedge portion (63) with a separating edge (64) and a pivotable lower jaw member (65).

23. Apparatus according to claim 22, characterized in, that the top jaw member (62) and/or the lower jaw member (65) is made from a flexible material to be able to build up a clamping force.

24. Apparatus according to claim 22 or 23, characterized in, that the lower jaw member is driven by a roller (67) on a lever acting upon a connecting rod, and that the roller (67) travels along a cam (14).

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25. Apparatus according to any of the preceding claims 22 to 24, characterized in, that the top jaw member (62) and/or the lower jaw member (65) comprise a plurality of clamping spots which are spaced apart from each other.

26. Apparatus according to any of the preceding claims 11 to 25, characterized in, that the separating gripper (60) comprises a supporting surface (71) by which the printed product may be supported after being gripped.

27. Apparatus according to any of the preceding claims 11 to 26, characterized in, that each discharge end of a feeder (1) is associated with a buffer shelf (80), on which the gripped printed products can be dropped by the separating grippers (60) and from where they can be forwarded by the collecting conveyor (10).